Single-Turn Continuous Rotation Analog Displacement Sensors

FEATURES

- Conductive plastic potentiometer technology, infinite resolution
- Servo mount anodized light alloy housing
- Precious metal contacts
- Stainless steel shaft and bearings
- Applicable standards: NFC 93255, MIL R39023

DESIGN SUPPORT TOOLS AVAILABLE

3D Models

QUICK REFERENCE DATA

<table>
<thead>
<tr>
<th>Sensor type</th>
<th>ROTATIONAL, conductive plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output type</td>
<td>Output by turrets</td>
</tr>
<tr>
<td>Market appliance</td>
<td>Industrial, avionics</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Ø 36, Ø 44, Ø 50, Ø 76</td>
</tr>
</tbody>
</table>

ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>POHR36</th>
<th>POHR44</th>
<th>POTH44</th>
<th>POTH50</th>
<th>POTH76</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical electrical travel (TET)</td>
<td>350° ± 3°</td>
<td>350° ± 3°</td>
<td>350° ± 3°</td>
<td>350° ± 2°</td>
<td>350° ± 1°</td>
</tr>
<tr>
<td>Theoretical electrical travel (on request)</td>
<td>-</td>
<td>62.5° 90° 120° 120° 182.5° 210° 90°</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Useful electrical travel (on request)</td>
<td>-</td>
<td>60° 90° 119° 180° 180° 89°</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Standard linearity (%)</td>
<td>± 0.5 %</td>
<td>± 0.5 %</td>
<td>± 0.5 %</td>
<td>± 0.25 %</td>
<td>± 0.1 %</td>
</tr>
<tr>
<td>Optional linearity (%)</td>
<td>± 0.25 %, ± 0.1 %, ± 0.05 %</td>
<td>± 0.4 %, ± 0.25 %, ± 0.1 %, ± 0.05 %</td>
<td>± 0.25 %, ± 0.2 %, ± 0.1 %, ± 0.05 %</td>
<td>± 0.1 %, ± 0.05 %, ± 0.03 %</td>
<td>± 0.05 %, ± 0.02 %</td>
</tr>
<tr>
<td>Total resistance range (E3)</td>
<td>4.7 kΩ or 10 kΩ</td>
<td>4.7 kΩ or 10 kΩ</td>
<td>4.7 kΩ or 10 kΩ</td>
<td>4.7 kΩ or 10 kΩ</td>
<td>4.7 kΩ or 10 kΩ</td>
</tr>
<tr>
<td>Tolerance on Rn</td>
<td>± 10 %, optional: ± 20 %, ± 15 %, ± 5 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output smoothness</td>
<td>&lt; 0.1 % (on request: 0.5 %, 0.05 %, 0.025 %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power rating at 70 °C</td>
<td>2 W</td>
<td>2.5 W</td>
<td>2.5 W</td>
<td>3 W</td>
<td>4 W</td>
</tr>
<tr>
<td>Temperature coefficient</td>
<td>-300 ± 300 ppm/°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiper current</td>
<td>≤ 1 mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended load impedance</td>
<td>≥ 1000 Rn</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>≥ 10 GΩ at 500 VDC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>1000 V_RMS, 50 Hz, 1 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MECHANICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>POHR36</th>
<th>POHR44</th>
<th>POTH44</th>
<th>POTH50</th>
<th>POTH76</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>15</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Running and starting torque (cN cm)</td>
<td>first stage 20</td>
<td>second stage 20</td>
<td>20</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>additional stage 18</td>
<td>18</td>
<td>18</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>Moment of inertia (g cm²)</td>
<td>first stage 2.2</td>
<td>&lt; 2.6</td>
<td>&lt; 6</td>
<td>&lt; 8</td>
<td>&lt; 20</td>
</tr>
<tr>
<td></td>
<td>additional stage 0.6</td>
<td>≤ 0.6</td>
<td>≤ 5</td>
<td>≤ 6</td>
<td>≤ 17</td>
</tr>
<tr>
<td>Weight (g)</td>
<td>first stage 50</td>
<td>80</td>
<td>100</td>
<td>100</td>
<td>230</td>
</tr>
<tr>
<td></td>
<td>additional stage 12</td>
<td>12</td>
<td>50</td>
<td>55</td>
<td>80</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**PERFORMANCE**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life</td>
<td>25M cycles</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-55 °C to +125 °C</td>
</tr>
<tr>
<td>Rotation speed</td>
<td>600 rpm</td>
</tr>
</tbody>
</table>

**Note**
- Nothing stated herein shall be construed as a guarantee of quality or durability.

**SAP PART NUMBERING GUIDELINES**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SIZE (mm)</th>
<th>GANG</th>
<th>VALUE</th>
<th>LINEARITY</th>
<th>ANGLE</th>
<th>PACKAGING</th>
</tr>
</thead>
<tbody>
<tr>
<td>POTH</td>
<td>44</td>
<td>1</td>
<td>472</td>
<td>B = 0.5 %</td>
<td>350</td>
<td>b = box</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>2</td>
<td>403</td>
<td>C = 0.25 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>78</td>
<td>3</td>
<td>103</td>
<td>D = 0.1 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>36</td>
<td>4</td>
<td>103</td>
<td>E = 0.05 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>5</td>
<td>103</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>350</td>
<td>6</td>
<td>103</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>350</td>
<td>7</td>
<td>103</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>350</td>
<td>8</td>
<td>103</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DIMENSIONS** in millimeters

**POHR36**

- Number of cups: 1, 2, 3, 4, 5, 6, 7, 8
- L: 21, 26, 31, 36, 41, 46, 51, 56
DIMENSIONS in millimeters

DEVELOPED ON REQUEST FOR POHR36

OPTION 1

[Diagram of dimensions for option 1]

OPTION 2

[Diagram of dimensions for option 2]
## Dimensions

### POHR44

<table>
<thead>
<tr>
<th>Number of cups:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>L:</td>
<td>21</td>
<td>26</td>
<td>31</td>
<td>36</td>
<td>41</td>
<td>46</td>
<td>51</td>
<td>56</td>
</tr>
</tbody>
</table>

**Designs on Request for POHR44**

**Option 1**

<table>
<thead>
<tr>
<th>10 ± 0.13</th>
<th>21 ± 0.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 ± 0.2</td>
<td>9 min.</td>
</tr>
<tr>
<td>1.6 ± 0.1</td>
<td>1.6 ± 0.1</td>
</tr>
<tr>
<td>1.9 ± 0.2</td>
<td></td>
</tr>
</tbody>
</table>

Approximate electrical zero

Slot width 0.8 ± 0.2 depth 1 ± 0.4

3 wires AWG 24: yellow, red, green

Approximate U/2

R26.5 max.

20° ± 5°
DIMENSIONS in millimeters

OPTION 2

View F

Slot width: 0.8 ± 0.2
Depth: 1 ± 0.4
Approximate electrical zero

12.5 ± 0.5
5 ± 0.15
9 min.

16 ± 0.1
1.6 ± 0.1
1.9 ± \frac{0.05}{0.15}

3 wires AWG24: yellow, red, green
Length: 300

OPTION 3

View F

Slot width: 0.8 ± 0.2
Depth: 1 ± 0.4
Approximate electrical zero

12.5 ± 0.5
5 ± 0.15
9 min.

16 ± 0.1
1.6 ± 0.1
1.9 ± \frac{0.05}{0.15}

3 wires AWG24: yellow, red, green
Length: 300
DIMENSIONS in millimeters

OPTION 4

View F

Slot width: 0.8 ± 0.2
Depth: 1 ± 0.4

Wires output

Approximate electrical U/2

Sleeve

25.48 ± 0.25
27 ± 0.5

1.52 ± 0.1
1.52 ± 0.1
1.52 ± 0.1

4 wires AWG26:
yellow, red, green and black
Length: 300

Clockwise viewed shaft side

OPTION 5

View F

Slot width: 0.8 ± 0.2
Depth: 1 ± 0.4

Approximate electrical zero

3 wires: yellow, red, green
Length: 300

3 wires: green / black, red / black, yellow / black
Length: 300

Clockwise viewed shaft side

Counterclockwise viewed shaft side
POHR36, POHR44, POTH44, POTH50, POTH76

Vishay MCB

**DIMENSIONS** in millimeters

**OPTION 6**

Approximate electrical zero

Slot width: 0.8 ± 0.2
Depth: 1 ± 0.4

3 wires: yellow, red, green
Length: 300

3 wires: green / black, red / black, yellow / black
Length: 300

**OPTION 7**

Approximate electrical zero

Clockwise viewed shaft side

Cable ASNE 0412 VF24
Length: 1000

Socapex connector:
JT 06 RT 835 P023

For technical questions, contact: mcbprecisionpot@vishay.com

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### Dimensions in millimeters

**POTH44**

<table>
<thead>
<tr>
<th>Number of cups</th>
<th>L:</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26.5</td>
<td>42</td>
<td>57.5</td>
<td>73</td>
</tr>
</tbody>
</table>

**POTH44 with connector (on request)**

- **Connector:** ref. souriau 810 6R10 06 PN01 or ref. deutsch 910 6R10 06 PN01
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
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- **Depth:** 1 ± 0.4
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- **Depth:** 1 ± 0.4
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- **Depth:** 1 ± 0.4
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- **Depth:** 1 ± 0.4
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- **Depth:** 1 ± 0.4
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- **Depth:** 1 ± 0.4
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- **Depth:** 1 ± 0.4
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- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
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- **Depth:** 1 ± 0.4
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- **Depth:** 1 ± 0.4
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- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
- **Depth:** 1 ± 0.4
- **Approximate electrical zero**
- **Slot width:** 0.8 ± 0.2
## DIMENSIONS in millimeters

### POTH50

<table>
<thead>
<tr>
<th>Number of cups:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>L:</td>
<td>25</td>
<td>40</td>
<td>55</td>
<td>70</td>
<td>85</td>
</tr>
</tbody>
</table>

### POTH76

<table>
<thead>
<tr>
<th>Number of cups:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>L:</td>
<td>27.5</td>
<td>43</td>
<td>58.5</td>
<td>74</td>
<td>89.5</td>
</tr>
</tbody>
</table>
OPTIONS (on request)

- Other ohmic values: 2.5 kΩ (POHR36); 1.6 kΩ, 2 kΩ, or 2.8 kΩ (POHR44); 1 kΩ (POTH44)
- Other tolerances on \( R_n \) (see “Electrical Specifications” table): ± 20 %
- Other lineairties (see “Electrical Specifications” table): 0.2 % (POHR36)
- Other theoretical electrical travel: 354° ± 1° and 120° (with UET = 100°) (POHR36); 120° (with UET = 100°) (POHR44)
- Connectors (center tap)
- Wire outputs (only on POHR44 and POTH44)
- Through shaft
- Phasing between wipers: 180° ± 2° (POHR36 x 2)
- Specific function:
  - sine and cosine (360°) with accuracy ± 0.2 %
  - switch sector with accuracy ± 1° or ± 30’ (POHR44)
- Middle tap: POHR44 U/2 ± 0.5 %
- For space application: removing of fabrication for tracks and ball bearings
- Protection resistor in series with wiper: 150 Ω; 300 Ω (± 15 %)
- Version waterproof: POHR44 (starting torque ≤ 60 cNcm)
- Electrical output by connector: plug Socapex: JT 06 RT 835 P023 (or equivalent) with cable length 1 m
- Version supplying voltage: 6 V < U < 30 V
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